

Automatic Chord Recognition in Music Education Applications

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ABSTRACT

In this work, we demonstrate the market-readiness of a recently published state-of-the-art chord recognition method, where automatic chord recognition is extended beyond major and minor chords to the extraction of seventh chords. To do so, the proposed chord recognition method was integrated in the Songs2See Editor, which already includes the automatic extraction of the main melody, bass line, beat grid, key, and chords for any musical recording.

1. DESCRIPTION

Gamification of music education has experienced a boost in popularity in recent years due to new possibilities for user interaction enabled by advancements in the field of Music Information Retrieval (MIR) [1]. As an alternative to playing music with printed score sheets, interactive applications with real-time feedback to the users' performance were brought to the market. Some examples of such applications include: Rocksmith¹, Skoove², Songs2See Game³, and Yousician⁴. Besides enabling the analysis of users' performances captured through a microphone, MIR techniques have also enabled the semi-automatic creation of score sheets from music recordings. This has been made publicly available with the release of applications such as Chordify⁵, Songle⁶, Songs2See Editor⁷, and plugins for Sonic Visualiser⁸ such as Chordino⁹.

By including the state-of-the-art algorithm for chord recognition proposed by Nadar et al. [2] in the Songs2See Editor, we aim to demonstrate its potential for real-life applications. This highlights the importance of further advancements in the field of MIR to enable non-experts to retrieve complete score sheets of their favorite songs with minimal manual corrections. An example of the proposed integration is shown in Figures 1 and 2.

¹ <https://rocksmith.ubisoft.com>

² <https://www.skoove.com>

³ <https://www.songs2see.com/en/products/game>

⁴ <https://yousician.com>

⁵ <https://chordify.net>

⁶ <https://songle.jp>

⁷ <https://www.songs2see.com/en/products/editor>

⁸ <https://www.sonicvisualiser.org>

⁹ <http://www.isophonics.net/nnls-chroma>

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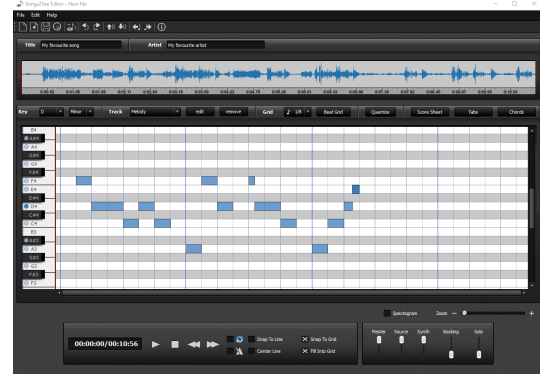


Figure 1. Songs2See Editor interface displaying the extracted melody and beat grid of an imported audio file.

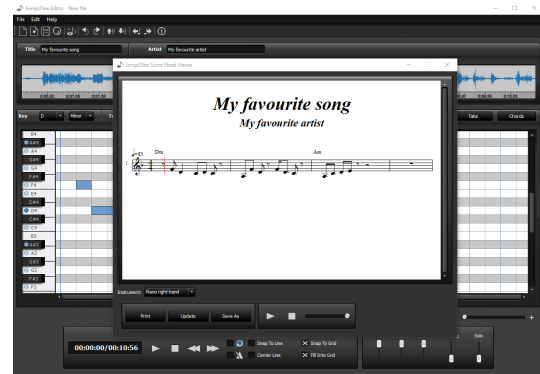


Figure 2. Final score sheet extracted by the Songs2See Editor (including chords) that can be printed or exported to other notation software.

2. REFERENCES

- [1] E. Cano, C. Dittmar, J. Abeßer, C. Kehling, and S. Grollmisch, "Music technology and education," in *Springer Handbook on Systematic Musicology*, R. Bader, Ed. Springer, Berlin, Heidelberg, 2018, pp. 855–871.
- [2] C.-R. Nadar, J. Abeßer, and S. Grollmisch, "Towards CNN-based acoustic modeling of seventh chords for automatic chord recognition," in *Proceedings of the International Conference on Sound and Music Computing*, Málaga, Spain, 2019.